

WHAT IS CLAIMED IS:

1. A laparoscopic bipolar electrosurgical instrument for sealing tissue, comprising:

a handle having an elongated tube affixed thereto, the tube including first and second jaw members attached to a distal end thereof, the jaw members being movable from a first position for approximating tissue to at least one subsequent position for grasping tissue therebetween, each of the jaw members including an electrically conductive sealing surface, the handle including a fixed handle and a movable handle, the movable handle being movable relative to the fixed handle to effect movement of the jaw members from the first position to the at least one subsequent position for grasping tissue;

means for connecting the jaw members to a source of electrosurgical energy such that the opposable seal surfaces are capable of conducting electrosurgical energy through tissue held therebetween;

a stop for maintaining a minimum separation distance of at least about 0.03 millimeters between opposable sealing surfaces; and

means for maintaining a closure force in the range of about 3 kg/cm² to about 16 kg/cm² between opposable sealing surfaces.

2. A laparoscopic bipolar electrosurgical instrument according to claim 1 wherein the connecting means includes:

a pushrod for connecting the first jaw member to a source of electrosurgical energy; and

a conductive tube for connecting the second jaw member to the source of electrosurgical energy.

3. A laparoscopic bipolar electrosurgical instrument according to any preceding claim wherein the maintaining means includes a ratchet disposed within the fixed handle and at least one complimentary interlocking mechanical interface disposed on the movable handle, the ratchet and the complimentary interlocking mechanical interface providing at least one interlocking position for maintaining a closure force within the range of about 7 kg/cm² to about 13 kg/cm² between opposable sealing surfaces.

4. A laparoscopic bipolar electrosurgical instrument according to any preceding claim wherein the closure force is in the range of about 4 kg/cm² to about 6.5 kg/cm².

5. A laparoscopic bipolar electrosurgical instrument according to any preceding claim wherein the stop is disposed on at least one of the sealing surfaces.

6. A laparoscopic bipolar electrosurgical instrument according to any preceding claim wherein the stop is disposed adjacent to at least one of the sealing surfaces.

7. A laparoscopic bipolar electrosurgical instrument according to any preceding claim wherein the stop maintains a minimum separation distance between sealing surfaces in the range of about 0.03 millimeters to about 0.16 millimeters.

8. A laparoscopic bipolar electrosurgical instrument for sealing tissue, comprising:

a handle having an elongated tube affixed thereto, the tube including first and second jaw members attached to a distal end thereof, the jaw members being movable from a first position for approximating tissue to at least one subsequent position for grasping tissue therebetween, each of the jaw members including an electrically conductive sealing surface, the handle including a fixed handle and a movable handle, the movable handle being movable relative to the fixed handle to effect movement of the jaw members from the first position to the at least one subsequent position for grasping tissue, the opposable sealing surfaces including a non-stick material for reducing tissue adhesion during the sealing process;

means for connecting the jaw members to a source of electrosurgical energy such that the opposable sealing surfaces are capable of conducting electrosurgical energy through tissue held therebetween;

a stop disposed on one of the opposable sealing surfaces for maintaining a minimum separation distance between the opposable sealing surfaces; and

a ratchet disposed on one of the fixed and movable handles and at least one complimentary interlocking mechanical interface disposed on the other of the fixed and movable handles, the ratchet and the complimentary interlocking mechanical interface providing at least one interlocking position to maintain a closure force in the range of about 3 kg/cm² to about 16 kg/cm² between opposable sealing surfaces.

9. A laparoscopic bipolar electrosurgical instrument according to claim 8 wherein the non-stick material is a coating which is deposited on the opposable sealing surfaces.

10. A laparoscopic bipolar electrosurgical instrument according to claim 8 or 9 wherein the non-stick coating is selected from a group of materials consisting of: nitrides and nickel/chrome alloys.

11. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9 or 10 wherein the non-stick coating includes at least one of: TiN; ZrN; TiAlN; CrN; nickel/chrome alloys with a Ni/Cr ratio of approximately 5:1; Inconel 600; Ni200; and Ni201.

12. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9, 10 or 11 wherein the opposable sealing surfaces are manufactured from a non-stick material.

13. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9, 10, 11 or 12 wherein the non-stick material is a nickel/chrome alloy.

14. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9, 10, 11, 12 or 13 wherein the non-stick material includes at least one of nickel/chrome alloys with a Ni/Cr ratio of approximately 5:1, Inconel 600, Ni200 and Ni201.

15. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9, 10, 11, 12, 13 or 14 wherein at least one of the jaw members, handles and elongated tube includes an insulative material disposed thereon.

16. A laparoscopic bipolar electrosurgical instrument according to claim 8, 9, 10, 11, 12, 13, 14 or 15 wherein the insulative material is an insulative coating.

17. A bipolar electrosurgical instrument according to claim 8, 9, 10, 11, 12, 13, 14, 15 or 16 wherein the insulative material is an insulative sheath.